

CLAIMS

1. An antenna device comprising:
 - a first radiation conductor operating at a first frequency;
 - 5 a first feeding lead wire coupled to the first radiation conductor;
 - a first matching circuit coupled to the first feeding lead wire;
 - a first short-circuit lead wire coupled to the first radiation conductor and grounded;
 - a second radiation conductor disposed in a state in which it is insulated
 - 10 from the first radiation conductor and operating at a second frequency that is higher than the first frequency;
 - a second feeding lead wire coupled to the second radiation conductor;
 - a second matching circuit coupled to the second feeding lead wire;
 - a second short-circuit lead wire coupled to the second radiation conductor
 - 15 and grounded; and
 - a transmitting/receiving circuit coupled to the first matching circuit and the second matching circuit.
2. The antenna device of claim 1,
 - 20 wherein the first short-circuit lead wire and the second short-circuit lead wire are disposed between the first feeding lead wire and the second feeding lead wire.
3. The antenna device of claim 1,
 - 25 wherein the first short-circuit lead wire and the second short-circuit lead wire are coupled to each other at their bottom parts.

4. The antenna device of claim 1,

wherein the first radiation conductor and the second radiation conductor are formed on a surface of or inside a spacer made of a dielectric substance.

5 5. The antenna device of claim 1,

wherein the first radiation conductor and the second radiation conductor are formed on different surfaces.

6. The antenna device of claim 1,

10 wherein at the first frequency, an impedance of the second radiation conductor is higher than an impedance of the first radiation conductor.

7. The antenna device of claim 1,

15 wherein at the second frequency, an impedance of the first radiation conductor is higher than an impedance of the second radiation conductor.

8. The antenna device of claim 1,

wherein the first radiation conductor and the second radiation conductor are provided with a crosspiece for adjusting a frequency.

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9. The antenna device of claim 1,

wherein the first matching circuit comprises a high-pass circuit, and the second matching circuit comprises a low-pass circuit, respectively.

25 10. The antenna device of claim 4,

wherein a terminal for holding an antenna element is provided in a region facing a region in which the first and second feeding lead wires and the

first and second short-circuit lead wires are coupled, respectively.

11. The antenna device of claim 1,

5 wherein at the first frequency, a load impedance of the transmitting/receiving circuit is substantially equal to an impedance from the first matching circuit to the first radiation conductor, and

at the second frequency, a load impedance of the transmitting/receiving circuit is substantially equal to an impedance from the second matching circuit to the first radiation conductor.

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12. The antenna device of claim 1,

wherein an angle made by a plane of the first short-circuit lead wire and a plane of the second short-circuit lead wire is substantially 90°.

15 13. The antenna device of claim 4,

wherein on a contour of the spacer, an open end of the first radiation conductor and an open end of the second radiation conductor are disposed facing each other.

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14. A wireless communication device using the antenna device of any one of claims 1 to 13.